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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,389	01/21/2004	Kunishige Oe	Q79276	1311
65565 7590 07/09/2007 SUGHRUE-265550 2100 PENNSYLVANIA AVE. NW WASHINGTON, DC 20037-3213			EXAMINER SANDERS, JANIS C	
			ART UNIT 1732	PAPER NUMBER
			MAIL DATE 07/09/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/760,389	Applicant(s) OE ET AL.	
	Examiner Janis Sanders	Art Unit 1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11 and 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413).
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>1/18/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's amendment to claims in the reply filed on 01 May 2007 is acknowledged. Claims 11 and 12 have been amended and claim 10 has been cancelled. Claims 1-9 and 11-12 are currently pending

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimura et al in view of Fuji et al.

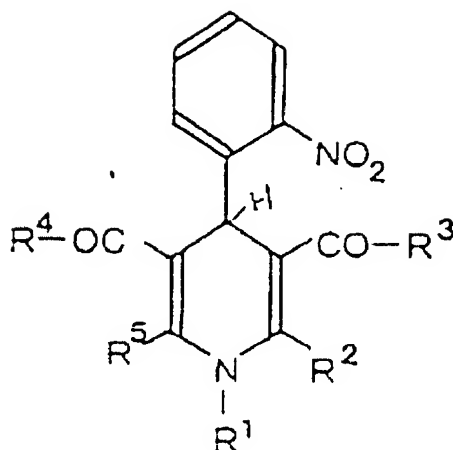
Yoshimura et al. (US 5,854,868) teaches a process for integrating optical devices and optical waveguides which comprises: first mounting one or more optical devices on a substrate, and then forming a refractive index distribution pattern and/or waveguide pattern on said substrate, by the steps of coating a material for forming said refractive index distribution pattern and/or waveguide pattern on said substrate and then patterning the material to form said

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refractive index distribution pattern and/or waveguide pattern, to form an optical coupling path communicating with said one or more optical devices (column 6, lines 2-11). A process for integrating optical devices and optical waveguides which comprises forming a split refractive index distribution pattern and/or waveguide sections to form a waveguide pattern on a substrate after mounting an optical device on the substrate, with spacing formed at the boundaries of the split refractive index distribution pattern and/or waveguide sections to form the waveguide pattern, after which a photosensitive substance made of a material in which the refractive index or solubility is changed by light exposure, such as a photo-refractive index material or light curing material is applied to the regions which include said spacing, and light of a wavelength to which said photosensitive substance is sensitive is emitted from either or both the refractive index distribution pattern and or optical waveguide pattern to form an optical coupling bath (column 6, lines 46-60). Finally, after formation of the waveguide by RIE, the resist is peeled off, and the buffer layer is coated (column 2, lines 49-51). The reference further discusses that a waveguide may be formed using a highly transparent, highly heat-resistant polymer such as a fluorinated polyimide, or quartz or another glass or polymer material (column 3, lines 45-47).

Yoshimura teaches of a method of making a waveguide and using light to separate the photosensitive substance from substrate (resin). However, the reference does not teach of the chemical structures of the resin or photosensitive substance that comprise to make the waveguide.

Fuji et al (US 6,300,037) teaches the photosensitive polyimide resin, which contains 1,4-dihydropyridine derivative, is represented by the following general formula:



wherein R1 to R5 each independently is a hydrogen atom or an organic group having 1 to 4 carbon atoms (column 3, lines 46-63).

Examples of the above photosensitizer include 1-ethyl-3,5-dimethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine, 1,2,6-trimethyl-3,5-dimethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine, 2,6-dimethyl-3,5-diacetyl-4-(2-nitrophenyl)-1,4-dihydropyridine, and 1-carboxyethyl-3,5-dimethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine. These may be used alone or in combination of two or more thereof. Especially preferred of these is 1-ethyl-3,5-dimethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine or 1,2,6-trimethyl-3,5-dimethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine (column 3-4, lines 66-67 and 1-9).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Yoshimura to include a resin chemical composition comprising of: a resin and 1,4-dihydropyridine, as taught by Fuji et al (US 6,300,037).

Yoshimura et al. suggests the use of a photosensitive polyimide resin (column 4, lines 52-56). Fuji et al. provides a specific example of such a resin thereby providing one of ordinary skill

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with motivation to make the substitution. Yoshimura, as modified by Fuji, further does not teach of the resin composition containing 0.1 to 30 parts by weight of 1,4-dihydropyridine derivative per 100 parts by weight of the resin.

However, one of ordinary skill would recognize that the effectiveness of the resin composition would depend upon its chemical composition and the amount of the photosensitive derivative. One of ordinary skill would have been motivated to do so to optimize the resin composition for an effective waveguide substrate. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose the instantly claimed ranges through process optimization, since it has been held that when the general condition of a claim is disclosed in the prior art, discovering the optimal or workable ranges involves only routine skill in the art. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

New Rejections

Claim Rejections - 35 USC § 112, second paragraph

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claims 1-9 and 11-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation “removing the 1,4-dihydropyridine derivative from the resulting resin composition.” It is unclear whether the 1,4-dihydropyridine derivative is removed from the light exposed or unexposed resin. For the purpose of examination, it is understood that the 1,4-dihydropyridine derivative is only removed from the unexposed resin (as disclosed in specifications pg. 27).

Claim 1 further recites the term “resulting resin.” It is unclear if the ‘resulting resin’ is light exposed resin, unexposed resin, or both. For the purpose of examination it is understood that resulting resin is the remaining unexposed resin.

Clarification and/or correction are required.

Response to Arguments

6. The amendment filed 01 May 2007 is sufficient to overcome the objection of claim 10.

7. Applicant's arguments filed 24 January 2007 have been fully considered but they are not persuasive.

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8. Applicant's arguments appear to be on the following grounds:

1. The applicant first argues that it would not have been obvious to one having ordinary skill in the art to modify the method of Yoshimura to include a resin composition comprising a resin and 1,4-dihydropyridine and submits that a prima facie case of obviousness has not been established.

2. The applicant also argues that in claim 1, the 1,4-dihydropyridine derivative is removed from the resin material. Fuji does not disclose the removal of the photosensitizer (i.e., a 1,4-dihydropyridine derivative) from the resin material. Further, Yoshimura does not disclose the removal of the photosensitive substance provided in the space between waveguides or between waveguides and fibers. Therefore, even if Yoshimura and Fuji were somehow combined, the references do not teach or suggest all of the elements of claim 1.

9. These arguments are not persuasive for the following reasons:

1. In response to the applicant's argument to the lack of motivation to combine references, it is the position of the examiner that the reference Yoshimura (US 5,854,868) discloses a photopolymer used to form the waveguide is generally an acrylic or epoxy polymer, and highly heat-resistant materials include photosensitive polyimides, and the like (col.4, lines 51-55). Fuji (US 6,300,037) discloses the object of the invention is to provide a photosensitive resin composition capable of forming a patterned film and exhibits satisfactory adhesive properties even when used for electronic parts of various shapes (col. 1, lines 50-58).

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Yoshimura et al. to include 1,4-dihydropyridine derivative as a photosensitive polymer as taught by Fuji et al. One of ordinary skill would have been motivated to do so because the photosensitizer would make the resin more sensitive to light, thereby decreasing the curing time of the application of light. Because both references are concerned with photosensitive resin compositions used for bonding, one would have a reasonable expectation of success from the combination.

2. It is the position of the examiner that the reference Yoshimura et al. does teach of photosensitive polymer removal. After formation of the waveguide by RIE, the resist is peeled off (col. 2, lines 49-50). It is observed by the examiner, that the resist is the non-irradiated (unexposed) material. Fuji et al. further discloses a film was exposed to light, then areas were treated to dissolve and remove the unexposed areas of the film, leaving the polyimide resin precursor (col. 6, lines 44-51).

Remarks

10. No claim is allowed.

Conclusion

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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis Sanders whose telephone number is 571-272-7145. The examiner can normally be reached on M-F 8-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Janis Sanders
Patent Examiner
Art Unit 1732

7/03/07


CHRISTINA JOHNSON
SUPERVISORY PATENT EXAMINER

7/3/07